BTEC Assignment Brief

Qualification	Pearson BTEC International Level 3 Diploma in Engineering Pearson BTEC International Level 3 Diploma in Mechanical Engineering Pearson BTEC International Level 3 Diploma in Manufacturing Engineering Pearson BTEC International Level 3 Extended Diploma in Engineering Pearson BTEC International Level 3 Extended Diploma in Mechanical Engineering Pearson BTEC International Level 3 Extended Diploma in Manufacturing Engineering
Unit number and title	**Unit 42: Manufacturing Primary Forming Processes**
Learning aim(s)	**A:** Examine how moulding processes involving metals, ceramics and polymers are used in industry
Assignment title	Moulding processes
Assessor	
Issue date	
Hand in deadline	

Vocational Scenario or Context	You are working as an apprentice technician with an engineering organisation that carries out the primary forming of components using metallic, ceramic and polymer materials for products that are manufactured in high volumes. Your supervisor has been monitoring your progress and is pleased with your understanding of the processes that you carry out as part of your work. She has asked you to research and investigate a range of moulding processes and to produce a bank of training materials that can be used with new members of staff.

Task 1	You have been asked to investigate moulding techniques that are used for metals, ceramics and polymers. You will need to compare the processes and present an evaluation that considers these processes as well as the wider factors that need to be taken in to account when selecting processes. **To do this:** You first need to carry out some research into casting (metal moulding) processes, moulding processes used for ceramics and moulding processes used for polymers. During your research you need to find out about: • The characteristics and applications of the casting and moulding (for ceramics and polymers) processes

	• The materials used for casting and moulding • Blending and compacting for powder metallurgy (ceramic moulding) and the additives used when casting metals and moulding polymers • The need for secondary operations, such as machining and component removal/finishing • Mould features for casting metals and moulding polymers • Moulding parameters for polymers • The sustainability of the casting and moulding processes. **You then need to:** Use your research, when producing a portfolio of evidence that includes both written work and diagrams, to evaluate the selection of moulding processes for three given components. One will be manufactured from a metallic material, one from a ceramic material and one from a polymer material. Your evaluation should include information on: • The specific characteristics of the three moulding processes that makes them suitable for the applications • Sustainability issues related to the moulding processes, for example energy use, water consumption and the environmental impact of the extraction and use of materials • The function of additives in the moulding processes • Process features and parameters, including the features of moulds and the methods used to remove and finish the moulded components • Any secondary processing requirements that are required upon completion of the moulding processes • Any other relevant considerations, including why the chosen processes are more suitable in comparison to other moulding processes for each material type. You should evaluate the importance of the characteristics and all of the other considerations for each of the moulding processes/materials/components that you consider, explaining why each process is the most suitable for the application.
Checklist of evidence required	A portfolio containing written responses and diagrams showing moulding techniques for each material type, supported by a PowerPoint presentation.

Criteria covered by this task:	
Unit/Criteria reference	To achieve the criteria you must show that you are able to:
42/A.D1	Evaluate, using language that is technically correct and of a high standard, the use of different moulding processes to manufacture components from metallic, ceramic and polymer materials.
42/A.M1	Compare the different moulding processes used to manufacture components from metallic, ceramic and polymer materials.
42/A.P1	Explain the moulding processes used to manufacture components from metallic materials.
42/A.P2	Explain the moulding processes used to manufacture components from ceramic materials.
42/A.P3	Explain the moulding processes used to manufacture components from polymer materials.
Sources of information to support you with this Assignment	**Books** Black BJ – Workshop Processes, Practices and Materials, 5th Edition (Routledge, 2015) ISBN 9781138784727. Campbell J - Complete Casting Handbook: Metal Casting Processes, Metallurgy, Techniques and Design (Butterworth-Heinemann, 2015) ISBN 9780081001202 Davidi G – Plastic forming processes of composite materials (Scholar's Press, 2013) ISBN 978-3639700848. **Websites** bpf.co.uk/ - British Plastics Federation plasticmoulding.ca/techniques.htm thelibraryofmanufacturing.com/ - Library of Manufacturing